

**REMARKS**

Claims 60, 67 and 69 are amended. Claims 60-72 are pending in the application.

Claim 67 stands rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to make or use the invention. The Examiner states that the specification fails to define standards or measurements of determining the recited "uniformly" or the recited "fine". Claim 67 stands additionally rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. The Examiner states that claim 67 is indefinite because the recited term "as" renders the claim unclear. Without admission as to the propriety of the Examiner's § 112 rejections of claim 67, applicant has amended claim 67 to recite one or more other elements being within intermetallic compound precipitates in the alloy microstructure. The amendment to claim 67 is supported by the specification at, for example, page 11, lines 14-22. As amended claim 67 no longer recites the terms "uniformly", "fine", or "as". Accordingly, applicant respectfully requests withdrawal of the § 112 rejection of claim 67 in the Examiner's next action.

Claims 60-62, 65 and 67-72 stand rejected under 35 U.S.C. § 103 as being unpatentable over Dunlop, U.S. Patent No. 5,590,389. The Examiner is reminded by direction to MPEP § 2143 that a proper obviousness rejection has the following three requirements: 1) there must be some suggestion or motivation to modify or combine reference teachings; 2) there must be a reasonable expectation of success; and 3) the combined references must teach or suggest all of the claim limitations. Claims 60-62, 65 and 67-72 are allowable over Dunlop for at least the reason that Dunlop fails to disclose or

suggest each and every limitation in any of those claims.

As amended independent claim 60 recites a target consisting essentially of an alloy of copper and a total concentration of one or more other elements of from less than 1.0 at% to 0.001 at%, the one or more other elements selected from the group consisting of Sr, Ba, Sc, and Se. The amendment to claim 60 is supported by the specification at, for example, page 9, lines 8-19 and the tables at page 10.

Dunlop discloses formation of targets comprising a metal which can include copper and which can also include up to 10% of chromium, titanium, tungsten, tantalum, molybdenum or alloys thereof (col. 4, ll. 22-25). The range of additional elements disclosed by Dunlop is broad relative to the claim 60 recited less than 1% to 0.001% total concentration of elements other than copper. Further, Dunlop does not disclose or suggest the copper alloy containing the elements specifically recited in claim 60. As indicated in applicant's specification at, for example, page 11, line 5 through page 12, line 11, the recited amount of specific elements can result in a clean copper matrix with a small amount of elemental precipitate resulting in little copper lattice distortion and leaving the electrical resistivity very close to pure copper. Accordingly, the recited amount of specified elements confers distinct advantage to the alloy which is not disclosed or suggested by Dunlop. Independent claim 60 is therefore not rendered obvious by Dunlop and is allowable over this reference.

Dependent claims 62, 65 and 67-68 are allowable over Dunlop for at least the reason that they depend from allowable base claim 60.

As amended, independent claim 69 recites a physical vapor deposition target consisting essentially of a copper alloy having a purity of 99.9998% with a total

concentration of other elements of from less than 1.0 at% to 0.001 at%. Independent claim 69 is allowable over Dunlop for at least reasons similar to those discussed above with respect to independent claim 50.

Dependent claims 70-72 are allowable over Dunlop for at least the reason that they depend from allowable base claim 69.

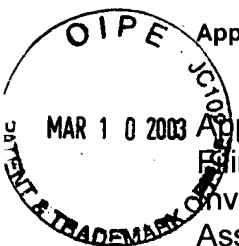
Claims 63-64 and 66 stand rejected under 35 U.S.C. § 103 as being unpatentable over Dunlop in view of Weber, U.S. Patent No. 4,786,469. As discussed above, independent claim 60 is not rendered obvious by Dunlop. Weber discloses copper based materials comprising additional grain refining elements and discloses that the base metal must contain a minimum of at least 4 additional elements, one of which must be either titanium or zirconium (col. 2, ll. 3-23). Weber does not teach or suggest the claim 60 recited alloy having a total concentration of other elements of from 0.001 at% to 1.0 at%. Further, Weber does not disclose or suggest the recited physical vapor deposition target consisting essentially of the recited alloy. As combined, Dunlop and Weber do not teach or suggest the claim 60 recited physical vapor deposition target consisting essentially of an alloy of copper containing a total concentration of other elements from less than 1.0 at% to 0.001 at% being selected from the group consisting of Sr, Ba, Sc and Se. Accordingly, independent claim 60 is not rendered obvious by the combination of Dunlop and Weber. Dependent claims 63-64 and 66 are allowable over the cited combination of Dunlop and Weber for at least the reason that they depend from allowable base claim 60.

For the reasons discussed above claims 60-72 are allowable. Accordingly, applicant respectfully requests formal allowance of claims 60-72 in the Examiner's next action.

Respectfully submitted,

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Appl. No. 09/784,234

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Assignee.....Honeywell International Inc.  
Group Art Unit.....1742  
Examiner ..... Ip, S.  
Attorney's Docket No. ....30-5000-(4015)-DIV1  
Title: Conductive Integrated Circuit Metal Alloy Interconnections, Electroplating Anodes,  
Metal Alloys for Use as a Conductive Interconnection in an Integrated Circuit, and  
Physical Vapor Deposition Targets

VERSION WITH MARKINGS TO SHOW CHANGES MADE ACCOMPANYING  
RESPONSE TO DECEMBER 17, 2002 FINAL OFFICE ACTION

In the Claims

The claims have been amended as follows. Underlines indicate insertions and  
~~strikeouts~~ indicate deletions.

60. (Currently Amended) A physical vapor deposition target consisting  
essentially of ~~comprising~~ an alloy of copper and one or more other elements, the one or  
more other elements being present in the alloy at a total concentration from less than 1.0  
at% to 0.001 at% and being selected from the group consisting of Sr, Ba, Sc, and Se.

67. (Currently amended) The physical vapor deposition target of claim 60  
wherein the one or more other elements are within intermetallic compound ~~present in the~~  
~~alloy as uniformly distributed fine precipitates in the alloy microstructure.~~



69. (Currently amended) A physical vapor deposition target comprising consisting essentially of a copper alloy, the alloy consisting of copper having a purity of 99.9998% alloyed with a total concentration of other elements of from less than 1.0 at% to 0.001 at%, the other elements being selected from the group consisting of Sr, Ba, Sc, and Se.

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